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LEIBNITZ'S CRITIQUE OF LOCKE.

TRANSLATED FROM THE FRENCH BY ALFRED G. LANGLEY.

NEW ESSAYS ON THE HUMAN UNDERSTANDING.

BOOK II.—IDEAS.

CHAPTER IV.

Of Solidity.

§ 1. *Philalethes*. You will doubtless agree that the idea of solidity is caused by the resistance we find in a body to the entrance of another body into the place it occupies until it has left it. That which thus hinders the approach of two bodies when they are moved one toward another I call solidity. If any one finds it more to the purpose to call it *impenetrability*, I give my consent. But I believe that the term solidity bears a more positive character. This idea seems most essential and most intimately connected with body, and can be found only in matter.

Theophilus. It is true that we find resistance in touch when another body reluctantly gives place to our own, and it is also true that bodies dislike to occupy the same place. Many, however, doubt whether this repugnance is invincible, and it is well also to consider that the resistance which is found in matter is, moreover, derived in a way and by means of reasons quite different. A body resists another either when it should leave the place which it has already occupied, or when it fails to enter the place where it should enter, because the other tries to enter also, in which case it may happen that, the one not yielding to the other, they stop or mutually repel each other. Resistance is seen in the change of that (body) to which resistance is offered, whether it loses its force, changes its direction, or both happen at once. Now you can say in general that this resistance arises from that repugnance which two bodies have of being in the same place, called impenetrability. Thus when one (body) makes an effort to enter, it at the same time forces the other to attempt to leave or to prevent its entrance. But that kind of incompatibility which makes one or the other, or both together, yield, being once assumed, there are several reasons besides the one named which make one body

resist another which endeavors to compel its departure. They are either in it or in the neighboring bodies. There are two which are in itself; one is passive and constant, the other active and variable. The first is what I call inertia,¹ after Kepler and Descartes, which impels matter to resist motion, and which it is necessary to destroy by force in order to move a body, supposing that there were neither gravity nor adhesion. Thus a body which undertakes to drive forward another, experiences for the time being this resistance. The other cause, which is active and variable, consists in the impetuosity of the body itself, which does not yield without resistance when its own impetuosity carries it into a place. The same reasons reappear in the neighboring bodies when the body which resists is unable to yield without causing the others to yield also. But here comes in a new consideration—viz.: compactness (*fermeté*) or the adhesion of one body to another. This adhesion² makes it impossible to move one body without at the same time moving the other to which it adheres, which causes a kind of *traction* in reference to this other. This adhesion so acts that, even should you put aside inertia and manifest impetuosity, there would be resistance; for if space is conceived as filled with matter perfectly fluid, and if a single hard body were placed within it, this hard body (supposing there were in the fluid neither inertia nor impetuosity) will be moved without finding any resistance; but if space be full of little cubes, the resistance which the hard body would find, should it be moved among the cubes, would come from the fact that the little hard cubes, on account of their hardness or because of the adhesion of their parts one to another, would with difficulty be divided so long as it were necessary to make a circular movement, and to fill up the place of the body moved at the moment it departs. But if two bodies should enter at the same time by the two ends into an open tube from two sides, and should fill it to its capacity, the matter in this tube, be it fluid or anything else, would resist by its impenetrability alone. Thus, in the resistance of which we are here treating, we have to consider impenetrability of bodies, inertia, impetuosity, and adhesion. It is

¹ Gerhardt reads *incertie*; evidently a slip of the pen in the original MS., or a typographical error of the printer.—Tr.

² Erdmann and Jacques add *souvent*, often.—Tr.

true that, in my opinion, this adhesion of bodies arises from a more subtle motion of one body toward another; but, as this is a point which may be disputed, it should not be assumed at first. And for the same reason we should only assume at first an original, essential solidity, which makes the place always equal to the body—*i. e.*, the incompatibility, or, to speak more accurately, the *non-consistence*¹ of bodies in the same place is a perfect impenetrability which receives neither more nor less, since many maintain that *sensible solidity* can arise from a repugnance on the part of bodies to be found in the same place, but which will not prove to be an invincible repugnance. For all the ordinary Peripatetics and many others believe that the same matter can fill more or less space, which phenomenon they call rarefaction or condensation, not in appearance only (as when water is squeezed from a sponge), but rigorously, like the Scholastic conception of the air. I am not of this opinion; but I do not think that I ought at first to assume the opposite opinion, the senses, apart from the reasoning faculty, not sufficing to establish this perfect impenetrability, which I hold to be true in the order of nature, but which is not learned by sensation alone. And some one may claim that the resistance of bodies to compression arises from an effort of the parts to spread themselves when they have not their entire liberty. For the rest the eyes aid greatly in proving these qualities, coming to the assistance of touch. And at bottom solidity, so long as it presents a distinct idea, is conceived by pure reason, although the senses furnish the reasoning faculty with the proof of it contained in nature.

§ 4. *Ph.* We are at least agreed that the *solidity* of a body carries with it the filling of the space it occupies in such a way as absolutely to exclude every other body [if a space can be found in which there was none before], while *hardness* [or the consistence rather, which some call compactness (*fermeté*)], is a strong union of certain portions of matter, which make up masses of a sensible size, so that the whole mass does not easily change its form.

Th. [This consistence, as I have already remarked, is what makes it difficult to move one part of a body without the other,

¹ Leibnitz's word is "l'inconsistence," and, as it is apparently technical, I have decided to transfer it, merely changing the form of the negative *in-* to *non-* to avoid ambiguity of meaning, rather than translate by a paraphrase, which would otherwise be necessary, as there seems to be no single equivalent English word or phrase.—*Tr.*

so that when one part is pushed, the other, which is not pushed, and which does not fall within the line of tendency, is nevertheless induced to go from that side by a kind of *traction*; and, further, if this last part finds any obstacle which holds or pushes it back, it draws it along, or holds back, also, the first part; and this action is always reciprocal. The same thing sometimes happens in the case of two bodies which do not touch and which do not form a continuous body whose parts are contiguous. However, the one pushed compels the other to go without pushing it, so far as the senses can give us knowledge. Of this the animant,¹ electrical attraction, and that which is sometimes ascribed to the fear of a vacuum, furnish examples.]

Ph. It seems that, in general, hard and soft are names which we give to things solely as related to the particular constitution of our bodies.

Th. [But then many philosophers would not ascribe hardness to their atoms. The notion of *hardness* does not depend upon the senses, and its possibility can be conceived by the reason, although we are further convinced by the senses that it is actually found in nature. I should, however, prefer the word *compactness*—*fermeté* (if I were allowed to use the word in this sense)—to that of *hardness*, for there is some compactness even in soft bodies. I seek even a more suitable and general term, like *consistence* or *cohesion*. Thus I would oppose hard to soft, solid to fluid, for wax is soft, but, unless melted by heat, it is not fluid and preserves its

¹ See Krauth-Fleming, "Vocab. Philos. Sciences," pp. 28, 29, and 571, edition of 1877. Sheldon & Co., New York, 1883. The *animant* = that which possesses and imparts life. Together with its cognates *animality*, *animalish*, *animalist*, used frequently by Cudworth. See "Intell. Syst.," 514, *Ut sit Animans*, that it be Animant, or endued with Life, Sense, and Understanding." *Ibid.*, 198. "But no Atheist ever acknowledged conscious *animality* to be a first principle in the universe; nor that the whole was governed by any *animalist*, sentient, and understanding nature, presiding over it as the head of it." The term being technical, and, with its cognates, more or less current in the seventeenth century, it seemed best to retain it, defining and illustrating as above. Its meaning is, I think, sufficiently evident. It is to be noticed, however, that Erdmann, in his "Errors Typographici," prefixed to his edition, reads *aimant* instead of *animant*. Jacques's text also has *aimant*. The translation would then be: The loadstone or magnet. As I translate on the basis of Gerhardt's text I retain his reading and its translation, with the note explaining the term, although at the present writing the reading of Erdmann and Jacques seems more congruous with the context, and so more likely to be the true one.—Tr.

bounds; and in fluids even there is ordinarily cohesion, as is shown in drops of water and of mercury. I am also of opinion that all bodies have some degree of *cohesion*, as I also believe that there are none which do not have some *fluidity*, and whose cohesion is not capable of being overcome; so that, in my opinion, the atoms of Epicurus, whose hardness is supposed to be invincible, cannot have any more authority than the subtile, perfectly fluid matter of the Cartesians. But this is not the place to justify this opinion or to explain the rationale of cohesion.

Ph. The perfect solidity of bodies seems to be justified by experiment. For example, water incapable of yielding, passed through the pores of a hollow globe of gold, in which it was shut up, when this globe was put under pressure in Florence.

Th. [There is something to be said as to the inference which you have drawn from this experiment, and from what happened in the case of the water. The air as well as the water is a body, which is compressible at least *ad sensum*, and those who would maintain a complete rarefaction and condensation will say that water is already too compressed to yield to our machines, as air very much compressed would resist also a further compression. I admit, however, on the other hand, that if any slight change should be noticed in the volume of the water, it might be ascribed to the air which is enclosed in it. Without entering now into the discussion whether pure water is not itself compressible, as it is found that it is dilatable when it evaporates, I am, nevertheless, decidedly of the opinion of those who believe that bodies are perfectly impenetrable, and that there is, save in appearance, neither condensation nor rarefaction. But this kind of experiment is as little capable of proving this as the tube of Torricelli or the machine of Gherike are sufficient to prove a perfect vacuum.

§ 5. *Ph.* If the body were strictly capable of rarefaction and compression, it might change in volume or extension, but, that not being so, it will be always equal to the same space; and, moreover, its extension will be always distinct from that of space.

Th. [The body might have its own extension, but it does not thereby follow that it will be always determined or equal to the same space. However, although it may be true that in the conception of body something besides space is conceived of, it does not thereby follow that there are two extensions—that of space

and that of body; for it is as when in conceiving several things at once, one conceives something besides the number, viz.: *res numeratas*; and, moreover, there are not two multitudes, the one abstract—*i. e.*, that of number; the other concrete—*i. e.*, that of the things enumerated. Likewise one can say that it is not necessary to think of two extensions—the one abstract, or space, the other concrete, of body, the concrete existing as such only through the abstract. And as bodies pass from one part of space to another—*i. e.*, change order among themselves—things also pass from one part of the order or of a number to the other, when, for example, the first becomes the second and the second the third, etc. In fact, time and space are only kinds of order, and in these orders the vacant place (which in relation to space is called vacuum), if there were any, would show the possibility only of that which is lacking together with its relation to the actual.

Ph. I am nevertheless very glad that you agree with me that matter does not change in volume. But you seem to go too far, Sir, in not recognizing two extensions, and you resemble the Cartesians, who do not distinguish space from matter. Now it seems to me that if a class is found who, not having these distinct ideas (of space and of solidity which fills it), blends them and makes of the two one only, we cannot see how these persons can converse with others. They are in that condition of a blind man with respect to another man who should speak to him of scarlet, whilst this blind man would believe that it resembles the sound of a trumpet.

Th. [But I hold at the same time that the ideas of extension and solidity, like that of scarlet-color, do not consist in a *I know not what*.¹ I distinguish extension and matter, contrary to the

¹ Leibnitz's expression is "*un je ne say quoi*." It seems to be equivalent to an indefinite somewhat which is the ultimate essence of things, and which is the cause of, and by differentiation becomes, the particular. Leibnitz, then, means to say that the ideas of extension and solidity are distinct. Cf. "Leibnitz's New Essays Concerning the Human Understanding. A Critical Exposition." By John Dewey, Ph. D., Chicago: S. C. Griggs & Co., 1888, p. 134. As applied to personal beings, it seems to be equivalent to the "unconscious representations"—*i. e.*, "the dark side of the soul-life," "the proper basis of Individuality." "Genius, disposition, feeling, are the terms by which a later time has designated what Leibnitz calls the *je ne sais quoi*, whereby every one is preformed by Nature to something Particular" ("Ganz wie bei dem blossen Monaden ihre individuelle Beschaffenheit in dem Momente der Schranke, der *materia prima*, lag, ganz so werden hier diese unbewussten Vorstellungen, d. h. wird die dunkle Seite des

view of the Cartesians. Still I do not believe that there are two extensions; and since those who dispute over the difference between extension and solidity are agreed on several truths upon this subject and have some distinct notions, they can find therein the means of extricating themselves from their disagreement; thus the assumed difference upon ideas ought not to serve as a pretext for eternal disputes, although I know that certain Cartesians, otherwise very able, are accustomed to intrench themselves in the ideas which they pretend to have. But if they would avail themselves of the means which I have before given for recognizing ideas true and false, and of which we shall speak also in the sequel, they would retire from a position which is not tenable.

CHAPTER V.

Of Simple Ideas which come by Different Senses.

Ph. The ideas, the perception of which comes to us from more than one sense, are those of Space, or Extension, or Figure, of Motion and Rest.

Th. [The ideas which are said to come from more than one sense, like those of space, figure, motion, rest, are rather from common-sense—*i. e.*, from the mind itself, for they are ideas of pure understanding, but related to externality, and of which the senses make us conscious; they are also capable of definition and demonstration.]

CHAPTER VI.

Of Simple Ideas which come by Reflection.

Ph. The simple ideas which come by reflection are the ideas of the understanding and of the will [for we ourselves are conscious of them in reflecting upon ourselves.]

Th. [It is doubtful if all these ideas are simple, for it is clear, for example, that the idea of the will includes that of the understanding, and the idea of motion contains that of figure.]

Seelenlebens, als der eigentliche Grund der Individualität bestimmt. Genius, Gemüth, Gefühl sind die Worte, mit denen eine spätere Zeit das bezeichnet hat, was *Leibnitz* das *je ne sais quoi* nennt, wodurch Jeder von Natur zu etwas Besonderem präformirt ist." Erdmann, "Grundriss d. Gesch. d. Philos.," 3te. Auflage 2te. Bd. s. 161. Berlin, 1878.) Cf. also Leibnitz, "Nouveaux Essais," Preface, pp. 46 sq. Gerhardt; 197, a, Erdmann; Book II, Ch. I, § 15. Th., sq., and Erdmann's exposition of the same, *op. cit.*, s. 160, 161. Also Prof. Dewey's most excellent work cited above.—Tr.

CHAPTER VII.

Of Ideas which come by Sensation and Reflection.

§ 1. *Ph.* There are some simple ideas which make themselves perceived in the mind by all the avenues of sensation and by reflection also—viz.: pleasure, pain, power, existence, unity.

Th. [It seems that the senses cannot convince us of *the existence* of sensible things without the aid of the reason. Thus I should think that the idea¹ of existence comes from reflection. That of power also and of unity come from the same source, and are of a wholly different nature from the perceptions of pleasure and pain.]

CHAPTER VIII.

Other Considerations upon Simple Ideas.

§ 2. *Ph.* What shall we say of ideas of privative qualities? It seems to me that the ideas of rest, darkness, and cold are as positive as those of motion, light, and heat. However, in proposing these privations as the causes of privative ideas I follow the common view; but in the main it will be difficult to determine whether there is really any idea which arises from a privative cause until it has been determined whether rest any more than motion is a privation.

Th. [I have never believed that you could have reason to doubt the privative nature of rest. It suffices it to deny motion in the body, but it does not suffice for motion to deny rest, and it is necessary to add something more to determine the degree of motion, since it receives materially more or less, while all rest is equal. It is another thing when you speak of the cause of rest, which should be positive in the second matter or mass. I should furthermore regard the idea itself of rest as privative—*i. e.*, that it consists only in negation. It is true that the act of denial is positive.]

§ 9. *Ph.* The qualities of things being the faculties they have of producing in us perception of ideas, it is well to distinguish these qualities. They are primary and secondary. Extension, solidity, figure, number, mobility are the original qualities inseparable from body which I call primary. § 10. But I call second-

¹ French is "la consideration de l'existence."

ary qualities the faculties or powers of bodies to produce certain sensations in us, or certain effects in other bodies, as the fire, for example, produces some effect in the wax when melting it.

Th. [I think you can say that when the power is intelligible, and can be distinctly explained, it should be reckoned among the primary qualities ; but when it is only sensed and gives only a confused idea, it should be put among the secondary qualities.]

§ 11. *Ph.* These primary qualities show how bodies act upon one another. Now, bodies act only by impulse, at least so far as we can conceive the process, for it is impossible to understand how bodies can act upon what they do not touch, which is equivalent to imagining that they can act where they are not.

Th. [I am also of the opinion that bodies act only by impulse. However, there is some difficulty in proving what I have just heard ; for attraction is not always without contact, and you can touch and draw without any visible impulse, as I have shown above in speaking of hardness. In the case of the atoms of Epicurus, the one part pushed would draw the other with it, and would touch it in putting it in motion without impulse. And in the case of attraction between contiguous things you cannot say that the one which draws with itself acts where it is not. This reason would militate only against attractions from a distance, as would be the case in reference to what are called *vires centripetas*, advanced by some scholars.]

§ 13. *Ph.* Now, certain particles, striking our organs in a certain way, cause in us certain sensations of colors or tastes or other secondary qualities which have the power of producing these sensations. And it is no more difficult to conceive that God can attach such ideas (as that of heat) to motions, with which these have no resemblance, than it is difficult to conceive that he has attached the idea of pain to the motion of a piece of iron which divides our flesh ; which motion the pain in no manner resembles.

Th. [It is not necessary to suppose that ideas like those of color or of pain are arbitrary and without relation or natural connection with their causes ; it is not the custom of God to act with so little order and reason. I should rather say that there is a kind of resemblance, not complete and, so to speak, *in terminis*, but expressive, or a kind of orderly relation, as an ellipse, and even a parabola or hyperbola resemble in some sense a circle of which

they are a projection upon a plane, since there is a certain exact and natural relation between what is projected and the projection which is made, each point of the one corresponding by a certain relation to each point of the other. This the Cartesians do not sufficiently consider, and for once you have deferred to them more than has been customary with you, and without reason for so doing.]

§ 15. *Ph.* I tell you how it appears to me, and the appearances are that the ideas of the primary qualities of bodies resemble these qualities, but the ideas produced in us by the secondary qualities resemble them in no way.

Th. [I have just shown how there is resemblance or exact relation in respect to the secondary as well as the primary qualities. It is certainly reasonable that the effect correspond to its cause; and how assert the contrary, since you know distinctly neither the sensation of blue (for example) nor the motions which produce it? It is true that pain does not resemble the motion of a pin, but it may very well resemble the motions which this pin causes in our body, and represent these motions in the soul, as I have no doubt it does. It is also on that account that we say that the pain is in our body and not that it is in the pin; but we say that the light is the fire, because there are in the fire motions which are not distinctly sensible apart from it, but whose confusion or conjunction becomes sensible, and is represented to us by the idea of light.

§ 21. *Ph.* But if the relation between the object and the sensation be natural, how can it be, as we notice in fact, that the same water may appear warm to one hand and cold to the other? which shows that the heat is no more in the water than the pain is in the pin.

Th. [That proves all the more that heat is not a quality of sense or power of making itself felt absolutely all at once, but that it is relative to the suitable organs; for a motion proper in the hand may be there mixed and change in appearance. Light, furthermore, does not make itself evident to badly constituted eyes, and when they are themselves filled with a great light, a less is not sensed by them. Even the primary qualities (according to our classification)—for example, unity and number—may not appear as they should; for, as Descartes has already stated, a globe touched by the fingers in a certain way appears double, and mir-

rors or glasses cut in facets multiply the object. It does not then follow that what does not always appear the same is not a quality of the object, and that its image does not resemble it. And as for the heat, when our hand is very warm, the medium heat of the water does not make itself felt, and modifies rather that of the hand, and consequently the water appears to us cold ; as the salt water of the Baltic Sea mixed with the water of the Sea of Portugal would lessen its specific saline quality, although the former would be itself salt. Thus, in any case, you can say that the heat belongs to the water of a bath, although it may appear cold to any one, as honey is called absolutely sweet, and silver white, although the one appears bitter, the other yellow to some diseased persons, for the classification is made upon the basis of the most common (conditions) ; and it remains true, however, that, when the organ and the medium are constituted as they should be, the internal motions and the ideas which represent them to the soul resemble the motions of the object which cause color, heat, pain, etc., or, what is the same thing, the experience by means of a relation sufficiently exact, although this relation does not distinctly appear to us, because we cannot disentangle this multitude of small impressions either in our soul or our body or in what is without.

§ 24. *Ph.* We consider the qualities which the sun has of blanching or melting wax or hardening mud only as simple powers, without thinking of anything in the sun corresponding to this blanching, softness, or hardness ; but heat and light are commonly regarded as real qualities of the sun. Properly considered, however, these qualities of light and heat which in me are perceptions are not in the sun in any other manner than the changes produced in the wax when it is blanched or melted.

Th. [Some have pushed this doctrine so far that they have desired to persuade us that if any one could touch the sun he would find there no heat. The imitated sun which makes itself felt in the focus of a mirror or a burning-glass may disabuse us of this notion. But as to the comparison between the power of heating and that of melting, I dare affirm that if the melted or blanched wax had feeling, it would feel something similar to what we feel when the sun warms us, and would say, if it could, that the sun is warm, not because its whiteness resembles the sun—for when

faces are tanned in the sun their brown color should likewise resemble it—but because there are in the wax motions which are related to those in the sun which cause them ; its whiteness may come from another cause, but not the motions which it has had in receiving it (whiteness) from the sun.

CHAPTER IX.

Of Perception.

§ 1. *Ph.* Come we now to the ideas of Reflection in particular. Perception is the first faculty of the soul which is occupied with our ideas. It is also the first and simplest idea which we receive by Reflection. Thought signifies often the mind's working upon its own ideas, when it acts and considers a thing with a certain degree of voluntary attention : but in what we call perception the mind is ordinarily purely passive, not being able to avoid perceiving what it actually perceives.

Th. [You might perhaps add that the animals have perception, and that it is not necessary that they have thought—*i. e.*, that they have reflection or what may be its object. We also have little perceptions in ourselves of which we are not conscious in our present state. It is true that we might very well perceive them in ourselves, and reflect upon them, if we were not hindered by their multitude, which divides our mind, or if they were not effaced, or rather obscured, by greater ones.

§ 4. *Ph.* I admit that when the mind is strongly occupied in contemplating certain objects it does not perceive in any way the impression which certain bodies make upon the organ of hearing, although the impression may be quite strong ; but no perception arises therefrom if the soul takes no cognizance thereof.

Th. [I prefer to distinguish between perception and consciousness.¹ The perception of light and color, for example, of which we are conscious, is composed of a quantity of small perceptions, of which we are not conscious ; and a noise which we perceive, but of which we take no notice, becomes a matter of consciousness by a little addition or increase ; for if what precedes made no impression upon the soul, this little addition would make no more, and

¹ Krauth-Fleming, "Vocab. Philos.," pp. 38, 374, 807.—Tr.

the whole would make none either. I have already touched upon this point (Ch. II¹ of this book, §§ 11, 12, 15, etc.).]

§ 8. *Ph.* It is proper to remark here that the ideas which arise from sensation are often altered by the mental judgment of grown persons without their perceiving the fact. The idea of a globe of uniform color represents a flat circle with various light and shade. But, as we are accustomed to distinguish the images of bodies and the changes of the reflections of light according to the figures of their surfaces, we put in the place of what appears to us the cause the image itself, and confuse the judgment with the appearance.

Th. Nothing is truer, and this it is which gives to painting the means of deceiving us by the artifice of a very extended perspective. When bodies have flat surfaces, they can be represented without employing shadows by giving only their contours and by simply making pictures after the fashion of the Chinese, but better proportioned than theirs. The same custom is observed in designing medals, in order that the draughtsman may be less likely to depart from the precise form of the antique. But you could not distinguish exactly by means of the design the interior of a circle from the interior of a spherical surface bounded by this circle without the aid of shadows, the interior of each having neither points distinguished nor distinguishing features, although there is, however, a great difference which ought to be indicated. Des Argues has accordingly given precepts upon the force of tints and shades. When, then, a painting deceives us there is a double error in our judgments; for first we put the cause for the effect, and think we see immediately the cause of the image, in which we resemble a little a dog who barks at a mirror; for, properly speaking, we see only the image, and we are affected only by the rays of light. And since the rays of light require time (however little it be), it is possible for the object to be destroyed in this interval, and for it no longer to exist when the ray reaches the eye, and that which no longer exists cannot be the object present to the sight. In the second place, we further deceive ourselves when we put one cause for another, and think that what comes only from a flat picture is derived from a body, so that in this

¹ This should be Chap. I, I think.—Tr.

case there is in our judgments all at once a metonymy and a metaphor ; for even the figures of Rhetoric pass into sophisms when they impose on us. This confusion of the effect with the cause, whether true or false, often enters into our judgments, moreover, from other causes. Thus it is that we feel our bodies, or what touches them, and that we move our arms by means of an immediate physical influence, which we think constitutes the connection of the soul with the body, while in truth we do not feel and do not change in that way what is in us.

Ph. I will at this time propose to you a problem which the learned Mr. Molineux, who employs so profitably his excellent genius in the promotion of the sciences, communicated to the illustrious Mr. Locke. Here it is nearly in his own terms: Suppose a man blind from birth, now grown up, who has learned to distinguish by touch a cube from a globe of the same metal, and almost of the same size, so that when he touches the one or the other he can tell which is the cube and which the globe. Suppose that the cube and the globe being placed upon the table, this blind man comes to enjoy his sight. The question is, if in seeing them without touching them he could distinguish them, and tell which is the cube and which the globe. I pray you, Sir, tell me what is your opinion upon the matter.

Th. I ought to give some time to thought upon this question, which appears to me quite curious: but since you press me for an immediate reply, I would venture to say between ourselves that I think that supposing the blind man knows that these two figures which he sees are those of the cube and the globe, he could distinguish them and say, without touching, This one is the globe, this the cube.

Ph. I fear lest it may be necessary to put you in the crowd of those who have failed to answer Mr. Molineux ; for he sent word in the letter which contained this question, that, having proposed it upon the occasion of Mr. Locke's "Essay upon Understanding" to different persons of very penetrating minds, he had found scarcely one among them who at once gave such a reply upon that point as he thinks should be made, although they were convinced of their error after having heard his reasons. The reply of this penetrating and judicious author is negative ; for (he adds) while this blind man has learned by experience of some kind the globe

and the cube as they affect his touch, he does not, however, yet know that what affects the touch in such or such manner ought to strike the eyes in such or such manner, nor that the projecting angle of the cube, which presses his hand in an unequal manner, ought to appear to his eyes as it appears in the cube. The author of the essay declares himself at once of the same opinion.

Th. Perhaps Mr. Molineux and the author of the essay are not so far from my opinion as at first appears, and the reasons for their view, contained apparently in the letter of the former, which have been used with success in convincing men of their error have been expressly left out by the second in order to give the reader's mind more exercise. If you wish to weigh my reply, you will find, Sir, that I have placed there a condition which can be considered as comprised in the question—viz.: that the question is not that of distinguishing alone, and that the blind man knows that the two figured bodies, which he should distinguish, are there, and that thus each of the appearances which he sees is that of the cube or the globe. In this case it appears to me indubitable that the blind man who has just ceased to be such can distinguish them by the principles of reason, united with that sense-knowledge with which touch has before furnished him. For I do not speak of that which he will do in fact and immediately, dazzled and confused by the novelty, or from some other cause little accustomed to draw inferences. The basis of my view is that in the globe there are no points distinguished by the side of the globe itself, the whole being even (smooth) and without angles, while in the cube there are eight points distinguished from all the others. If there were not this means of discerning figures, a blind man could not learn the rudiments of geometry by touch. But we see that those born blind are capable of learning geometry, and have indeed always certain rudiments of a natural geometry, and that most often geometry is learned by sight alone, without the use of touch, as indeed could and should be the case with a paralytic or other person to whom touch was almost forbidden. And these two geometries—that of the blind man and that of the paralytic—meet and agree, and indeed recur to the same ideas, although there are no common images. It further becomes evident how necessary it is to distinguish images from exact ideas, which consist in definitions. It would really be very curious and

instructive to make a complete examination of the ideas of a man born blind, to understand the descriptions he makes of figures. For he may happen upon, and he may even understand, optical doctrine, so far as it is dependent upon distinct and mathematical ideas, although he might not attain to the conception of *clair-confus*—i. e., the image of light and colors. This is why a certain one born blind, after having attended lessons in optics, which he appeared fully to understand, replied to some one who asked him what he thought light was, that he thought it was something pleasant like sugar. It would likewise be very important to examine the ideas which a man born deaf and dumb may have of things not figured, whose description we usually have in words, and which he must have in a manner wholly different from though it may be equivalent to ours, as Chinese writing is in fact equivalent to our alphabet, although it may be infinitely different, and might appear to have been invented by a deaf man. I learn, by the favor of a great prince, of one born deaf and dumb in Paris, whose ears have at last attained to the performance of their function, that he has now learned the French language (for it is from the court of France that he was summoned not long since), and that he could say very curious things about the conceptions he had of his former condition and about the change of his ideas when he commenced to exercise the sense of hearing. These persons born deaf and dumb can go farther than you think. There was one in Oldenburg in the time of the last Count who became a good painter, and showed himself very rational in other respects. A very learned man, Breton by nation, told me that at Blainville, about ten leagues from Nantes, belonging to the Duke of Rohan, there was, about 1690, a poor man, who lived in a hut near the castle outside of the town, who was born deaf and dumb, and who carried letters and other things to the town and found the houses, following some signs which the persons accustomed to employ him made him. Finally the poor man became blind also, but did not give up rendering some service and carrying letters into the town to whatever place they indicated to him by touch. He had a board in his hut which, extending from the door to the place where his feet were, informed him by its motion when any one entered his house. Men are very negligent in taking exact knowledge of the modes of thought of such persons. If

he no longer lives, there is probably some one in the vicinity who could still give some information respecting him, and make us understand how they showed him the things he was to do. But to return to what the man born blind, who begins to see, would think of the globe and the cube, seeing them without touching them, I reply that he will distinguish them, as I have just said, if any one informs him that the one or the other of the appearances or perceptions which he will have belongs to the cube or to the globe; but, without this previous instruction, I admit that he will not at first venture to think that the kinds of pictures which they will make of themselves in the depths of his eyes, and which might come from a flat picture upon the table, represent the bodies, until touch convinces him of the fact, or until, by force of reasoning upon the rays of light according to optics, he understands by the lights and shades that there is a something which arrests these rays of light, and that it is exactly what remains for him in touch, which result he will finally reach when he sees this globe and this cube revolve, and change the shadows and the appearances in accordance with the motion, or even when, these two bodies remaining at rest, the light which illumines them changes its place, or his eyes change their position. For these are about the means we have of distinguishing from afar a picture or a perspective, which represents a body, from the body itself.

§ 11. *Ph.* [Let us return to perception in general.] It distinguishes animals from inferior beings.

Th. [I am inclined to the belief that there is some perception and appetite also in the plants, because of the great analogy which exists between plants and animals; and if, as is commonly supposed, there is a vegetable soul, it of necessity has perception. Moreover, I do not allow myself to attribute to mechanism all that is done in the bodies of plants and animals, excepting their first formation. Thus I agree that the motion of the plant which is called sensitive arises from mechanism, and I do not approve of the recourse to the soul when the question is that of explaining the detail of the phenomena of plants and animals].

§ 14. *Ph.* It is true that for myself, indeed, I cannot help believing that even in those kinds of animals which are like the oysters and mussels there is not some feeble perception; for quick sensations would serve only to discommode an animal which is

constrained to live aways in the place where chance has put it, where it is watered with water, cold or warm, pure or salt, according as it comes to it.

Th. [Very well, I also believe that you can say almost as much of plants; but in man's case, his perceptions are accompanied with the power of reflection, which passes to the act when there is any. But when he is reduced to a state where he is as it were in a lethargy and almost without feeling, reflection and consciousness cease, and he does not think of universal truths. But the faculties and the dispositions, innate and acquired, and even the impressions which one receives in this state of confusion, do not cease on that account, and are not effaced, though they are forgotten. They will indeed have their turn one day in contributing to some notable result, for nothing is useless in nature; all confusion must develop itself. The animals themselves, having attained to a condition of stupidity, ought some day to return to perceptions more elevated, and, since simple substances always endure, it is not necessary to judge of eternity by a few years.]

CHAPTER X.

Of Retention.

§§ 1, 2. *Ph.* The other faculty of the mind, by which it advances toward the knowledge of things more than by simple perception, is that which I call Retention, which conserves the knowledge received by the senses or by reflection. Retention works in two ways: in actually conserving the present idea, which I call Contemplation; and in preserving the power to bring them again before the mind, and this is what is called Memory.

Th. [One retains also and contemplates innate knowledge, and very often one cannot distinguish the innate from the acquired. There is also a perception of images—either those which have already existed for some time, or those which are formed anew in us.]

§ 2. *Ph.* But you believe with us that these images or ideas cease to be anything as soon as they are not actually matters of consciousness; and that to say that there are ideas reserved in the memory means at bottom only that the soul has in some instances the power of reviving the perceptions it has already had with a

feeling which at the same time convinces it that it has previously had these kinds of perceptions.

Th. [If ideas were only forms or modes of thoughts, they would cease with them; but you have yourself admitted, Sir, that they are internal objects, and in this way can subsist. And I am astonished that you can always be satisfied with these powers or naked faculties, which you would apparently reject in the Scholastic philosophers. It would be necessary to explain a little more distinctly in what this faculty consists and how it is exercised; and that would make you know that there are dispositions which are the remains of past impressions in the soul as well as in the body, but of which we are conscious only when the memory finds some occasion for them. And if nothing restored past thoughts, as soon as you no longer think of them, it would be impossible to explain how the memory can preserve them; and to recur for this purpose to this naked faculty is to speak nowise intelligibly.]

CHAPTER XI.

Of Discernment or the Faculty of distinguishing Ideas.

§ 1. *Ph.* Upon the faculty of distinguishing ideas depends the evidence and certainty of several propositions which pass for innate truths.

Th. I admit that to think of these innate truths and to unravel them discernment is necessary; but they do not on that account cease to be innate.]

§ 2. *Ph.* Now, vivacity of mind consists in recalling promptly ideas; but judgment in representing them clearly and distinguishing them exactly.

Th. [Perhaps each is vivacity of imagination, and judgment consists in the examination of propositions according to reason.]

Ph. [I am not averse to this distinction of mind and judgment. And sometimes there is judgment in not employing it too much. For example: to examine certain witty thoughts by the severe rules of truth and good reasoning is in a certain sense an insult.]

Th. [This remark is a good one; it is necessary that witty thoughts have at least some apparent foundation in reason, but it is not necessary to examine them minutely with too much scrupulousness, as it is not necessary to look at a picture from a position

too near it. It is in this, it seems to me, that P. Bouhours fails more than once in his "Art de penser dans les ouvrages d'esprit,"¹ as when he despises this sally of Lucan²: *Victrix causa diis placuit, sed victa Catoni.*

§ 4. *Ph.* Another operation of the mind in respect to its ideas is the comparison which it makes of one idea with another as regards extension, degrees, time, place, or some other circumstance; it is upon this that the great number of ideas comprised under the term Relation depends.

Th. [According to my view, Relation is more general than comparison, for relations are either of comparison or of concurrence. The first concern the congruity or incongruity (I take these terms in a less extended sense) which comprises resemblance, equality, inequality, etc. The second comprise some connection, as that of cause and effect, of whole and parts, of position and order, etc.]

§ 6. *Ph.* The composition of simple ideas, for the purpose of making complex ideas, is also an operation of our mind. You can refer to this faculty the extension of ideas by uniting those of the same kind, as in forming a dozen from several units.

Th. [The one is doubtless as much composition as the other; but composition of similar ideas is simpler than that of different ideas.]

§ 7. *Ph.* A dog will nurse young foxes, will play with them, and will have for them the same fondness as for her own puppies, if they can be made to suck her so long as is needful for the milk to spread through their entire body. And it does not appear that animals, who have a large number of young at once, have any knowledge of their number.

Th. [The love of animals arises from a pleasure which is increased by habit. But as for the precise multitude, men even can know the numbers of things only by some skill, as in using numerical names in order to count, or figural arrangements which make them know at once without counting if anything is wanting.]

§ 10. *Ph.* Animals do not form abstract thoughts.

Th. [I agree. They apparently recognize whiteness, and notice

¹ Gerhardt's text. Erdmann has "*Manière de bien penser dans les ouvrages d'esprit.*" Which is the correct title I have no means of ascertaining.—Tr.

² 1 : 128.

it in the chalk or the snow ; but this is not yet abstraction, for that demands a consideration of the common (attribute), separated from the particular (case), and consequently there enters into it the knowledge of universal truths, which is not given to the animals. It is well said also that the animals which speak do not use words to express general ideas, and that men deprived of the use of speech and of words do not cease to make use of other general signs. And I am pleased to see that you here and elsewhere so well observe the advantages of human nature.]

§ 11. *Ph.* If animals have some ideas, and are not pure machines, as some maintain, we cannot deny that they have reasons in a certain degree, and, for myself, it appears as evident that they reason as that they feel. But it is only upon particular ideas that they reason according as their senses represent these ideas to them.

Th. [Animals pass from one idea to another by the connection which they sometimes feel ; for example, when his master takes a stick, the dog fears a whipping. And in a multitude of instances children with the rest of mankind proceed nowise differently in their passages from thought to thought. One might call that consequence and reasoning in a very broad sense. But I prefer to conform to the received usages in consecrating these terms to man and in limiting them to the knowledge of some reason of the connection of perceptions, which sensations alone cannot give, their effect being only to cause you to attend at another time to this same connection which you have noticed before, although perhaps the reasons are no longer the same, which fact often deceives those who are governed only by the senses.]

§ 13. *Ph.* Idiots lack vivacity, activity, and movement in the intellectual faculties, whence they are deprived of the use of reason. Madmen seem to be at the opposite extreme, for it does not appear to me that these latter have lost the power to reason, but having wrongly united certain ideas, they take them for truths, and deceive themselves in the same way as those who reason justly upon false principles. Thus you will see a madman who thinks he is king maintaining by a just consequence that he should be served, honored, and obeyed according to his rank.

Th. Idiots do not exercise reason, and they differ from some stupid persons who have good judgment, but, not having prompt conception, they are despised and disturbed as he would be who

wished to play ombre with persons of distinction and thought too long and too often of the part he must take. I remember a learned man who, having lost his memory by the use of certain drugs, was reduced to this condition, but his judgment always appeared. A man wholly mad lacks judgment on nearly every occasion; but the vivacity of his imagination may make him agreeable. But there are particular madmen who make a false supposition at an important point in their lives, and reason justly thereupon, as you have well said. There is such a man, well known at a certain court, who believes himself destined to redress the affairs of the Protestants and to bring France to reason, for which purpose God caused the greatest personages to pass through his body in order to ennoble it; he desires to marry all the princesses which he sees to be marriageable, but, after having made them holy in order to have a holy progeny who should rule the land, he attributes all the misfortunes of war to the little deference he had for their advice. In speaking with a certain sovereign, he took every necessary measure not to lower his dignity. And when they began to reason with him, he defended himself so well that I have doubted more than once whether his madness is not a feint, for he is not uncomfortable on account of it. However, those who know him more intimately assure me that his madness is wholly genuine.]

THE SPECTRUM-SPREAD OF OUR SENSATIONS.

BY PAYTON SPENCE.

The white light of the sunbeam is apparently simple and homogeneous, although it is, in reality, a compound of many colors. Each color of which it is composed occupies the whole of the beam, and hence no one of them has position in the beam; and therefore the colors themselves have no relative positions to each other. Each color, occupying the whole of the beam, has a modifying effect upon all the others, and all the others have a modifying effect upon it; consequently they are all equally modified